DOCUMENT RESUME

ED 164 979 08 CE 019 626

AUTHOR	Newcomb, L. H.
TITLE	Agricultural Education: Review and Synthesis of the Research. Information Series No. 139.
INSTITUTION	ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio.
SPONS AGENCY	National Inst. of Education (DHEW), Washington, D.C.
PUB DATE	78
CONTRACT	400-76-0122
NOTE	86p.
AVAILABLE FROM	National Center for Research in Vocational Education, Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210 (IN 139, $5.50)
EDRS PRICE	MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS	Adult Education; *Agricultural Education; Career Education; Curriculum; Curriculum Guides; Disadvantaged Youth; *Educational Research; Followup Studies; *Instruction; Performance Based Teacher Education; Postsecondary Education; Program Administration; Program Evaluation; Program Planning; *Research Needs; Secondary Education; State of the Art Reviews; Student Teaching; Task Analysis; *Teacher Education; Teacher Recruitment; Teacher Shortage; *Vocational Agriculture; Vocational Agriculture Teachers

ABSTRACT

Research studies in agriculture education conducted between 1969 and 1978 are analyzed to provide an overview of representative studies in the following areas. teacher education, instruction, curriculum, student services, recruitment and retention of teachers, disadvantaged students, program planning, evaluation studies, administration and supervision, adult education, postsecondary agricultural education, and career education in agriculture. (All studies selected relate to secondary and postsecondary vocational agriculture programs in the United States.) After research in each area is reviewed, summary comments are presented to indicate trends, patterns, and important findings in that area. Finally, overall conclusions and recommendations are presented based on the total review of the research. Some of these conclusions are as follows: (1) even though the profession has an abundance of task analysis information and nationally prepared curriculum guides available for all specialty areas, little attempt has been made to evaluate task lists or curriculum guides using actual field observations; (2) even though there appears to be sufficient work completed in identifying the professional competencies needed by vocational agriculture teachers, the profession could benefit from coordinated inquiry into which competencies improve student learning; and (3) even though there is substantial documentation of the shortage of vocational agriculture teachers, to date there is no evidence of a recruitment program successful enough to attract the attention of the profession. (BM)

Information Series No. 139

ED164979

AGRICULTURAL EDUCATION:
REVIEW AND SYNTHESIS OF THE RESEARCH

written by

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The National Center for Research in Vocational Education
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1960 Kenny Road
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1978

CE 019 926

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Research studies in agriculture education conducted between 1969 and 1978 are analyzed to provide an overview of representative studies in the following areas: teacher education, instruction, curriculum, student services, recruitment and retention of teachers, disadvantaged students, program planning, evaluation studies, administration and supervision, adult education, postsecondary agricultural education, and career education in agriculture. (All studies selected relate to secondary and postsecondary vocational agriculture programs in the United States.) After research in each area is reviewed, summary comments are presented to indicate trends, patterns, and important findings in that area. Finally, overall conclusions and recommendations are presented based on the total review of the research. Some of these conclusions are as follows: (1) even though the profession has an abundance of task analysis information and nationally prepared curriculum guides available for all specialty areas, little attempt has been made to evaluate task lists or curriculum guides using actual field observations; (2) even though there appears to be sufficient work completed in identifying the professional competencies needed by vocational agriculture teachers, the profession could benefit from coordinated inquiry into which competencies improve student learning; and (3) even though there is substantial documentation of the shortage of vocational agriculture teachers, to date there is no evidence of a recruitment program successful enough to attract the attention of the profession. (BM)

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FUNDING INFORMATION

Project Title:	ERIC Clearinghouse on Adult, Career, and Vocational Education
Contract Number:	NIE-C-400-76-0122
Educational Act Under Which the Funds were Administered:	Vocational Educational Amendments of 1976, P.L. 94-482
Source of Contract:	Department of Health, Education, and Welfare National Institute of Education Washington, D.C.
Project Officer:	Frank Smardak
Contractor:	The National Center for Research in Vocational Education The Ohio State University Columbus, Ohio
Project Director:	Marla Peterson
Disclaimer:	This publication was prepared pursuant to a contract with the National Institute of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to freely express their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official National Institute of Education position or policy.
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FOREWORD

The Educational Resources Information Center on Adult, Career, and Vocational Education (ERIC/CE) is one of sixteen clearinghouses in a nationwide information system that is funded by the National Institute of Education. One of the functions of the Clearinghouse is to interpret the literature that is entered in the ERIC data base. This paper should be of particular interest to vocational agricultural teachers, school administrators, supervisory personnel, and graduate researchers.

The profession is indebted to L. H. Newcomb for his scholarship in the preparation of this paper. Recognition also is due William Drake of Cornell University, Charles Drawbaugh of Rutgers University, and Floyd McKinney of The National Center for Research in Vocational Education for their critical review of the manuscript prior to its final revision and publication. Robert D. Bhaerman, Assistant Director for Career Education at the ERIC Clearinghouse on Adult, Career, and Vocational Education, supervised the publication's development. Cathy Thompson edited the draft manuscript and Anne Gilmore typed the final draft.

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INTRODUCTION

The studies analyzed in this paper were reported between 1969 and 1978. The various Summaries of Studies in Agricultural Education were used as the basic resource in identifying the research to be analyzed. (See References.) In addition, an ERIC computer search was conducted.

I do not purport to include all studies completed. Effort was made to select representative ones in each area. Additionally, those identified as exemplary studies were presented in more detail than representative studies. Lastly, only studies relating to secondary and postsecondary vocational agriculture in this country were considered. Extension education programs, elementary school programs, studies relating to agricultural subject matter focusing on local communities were excluded, as were studies of agricultural education in other countries.

This is an overview of what is currently known in each topical area. Major limitations were cases in which studies were so widely scattered that the findings could not always be clustered.

This paper could be useful for

1. Determining the state of the art in the areas reviewed.
2. Determining what has been accomplished in each area.
3. Locating findings which may apply to current problems at the local, state, or university levels.
4. Identifying studies which ought to be replicated.

5. Providing graduate faculty and students with a concise paper detailing information, identifying potential research problems, assessing the current literature, and deciphering the current "mentality" of research in this area.

6. Serving as a topography of the field in order to chart the direction for future research.

A special thanks should be given to Dr. Ralph E. Bender and Dr. J. Robert Warmbrod for providing time and graduate assistants for the project and also to Susan Jervey and John Parmley, graduate assistants, for their help in locating the primary resources.

TEACHER EDUCATION

COMPETENCY BASED TEACHER EDUCATION

Teacher education research completed since the second *Review and Synthesis of Research in Agricultural Education* is now dominated by many studies in competency based teacher education. Essentially all of them had components which rated both the need for and the use of selected competencies. These studies utilized variations of the competency lists developed by Cottrell and others and dealt with multiple purposes.

Herring (1976) reported on an attempt to identify and validate competencies for teacher education which were required for entry into teaching vocational agriculture and on procedures for incorporating them into agricultural education departments in Texas. Following this, procedures were developed for using a competency test.

Garner (1974) previously attempted to develop a checklist of eighty-six competencies. These competencies were then used in making program decisions in his department. Bonner (1976), however, determined that 108 competencies were needed by FFA advisors in Mississippi.

Jones (1975) determined how vocational agriculture teachers perceived their competence; when, where, and by whom these competencies should be developed, and the priority of each in teacher education programs.

Furthermore, he indicated how competent teachers felt in organizing and managing supervised occupational experience programs, conducting the FFA program and working in technical agriculture. He also determined how teachers viewed these priorities, the training they needed, the instructors they preferred, the need for a first year program, and the type of training to be offered at a summer conference. Jones also revealed that teachers felt their level of competency was adequate but they desired additional training in each area. They also preferred that competency development occur mainly at the preservice level.

Previously, Ely and Drake (1973) had studied performance based inservice program for occupational teachers. Using a list of performance behaviors, they surveyed occupational teachers and supervisors in BOCES centers and vocational high schools.

Stoller (1971) used high school instructors, county extension agents, and postsecondary instructors to identify competencies needed by agricultural educators.

Later, Moore (1974) determined the backgrounds of vocational agriculture teachers, college graduates in agricultural education, college graduates in technical departments in agriculture, and non-college graduates with strong industrial and business backgrounds. He measured their perceived levels of competence and their feelings on 128 competencies. He found that all teachers with degrees consistently rated high in importance the areas of management, guidance, and professional role and development. Least important were program planning, development and evaluation, school-community relations, and student FFA organization. Non-degreed teachers, however, rated the areas of guidance, planning of instruction, coordination, management, and execution of instruction as important. They also rated the competencies within the areas of evaluation of instruction, school-community relations, and student FFA organization low in importance.

Moore then asked the three groups to rate their perceived degree of competence. The college graduates rated their competence as above average for almost all 256 professional competencies. The non-college graduates rated their competence as above average on twelve of the 256 competencies.

Moore determined that the agriculture education majors showed a need for work in twenty-three of the 256 competencies; technical agriculture in ninety-nine competencies; the non-college graduates needed work in all competencies.

Carter (1976) identified the professional competencies needed by beginning teacher educators in agricultural education. He found that beginning teacher educators needed an average degree of ability on all 114 competencies and a high degree of ability on fourteen competencies. It was felt that beginning teacher educators currently were near this level of competence.

Researchers in agricultural education also used teachers or a group of their superiors in selecting the competencies which were most important and/or most often used.

Concerning competencies, the profession has the extensive work of the National Center for Research in Vocational Education from which to draw. This knowledge also has been used in program design and operation.

Attempts should be made to prepare teachers for possessing the previously identified competencies. The next step is for investigators to focus on what competencies help students learn more effectively and efficiently.

ANALYSES AND EVALUATION OF TEACHER EDUCATION PROGRAMS

Several researchers conducted studies concerning basic preparation of vocational agriculture teachers. Chyung (1970) found that student teachers felt activities were more important once they had experienced them. They placed greatest emphasis on the activities relating to organizing and maintaining a department but those who had actually taught felt planning for instruction was the most important experience area. Both groups felt more opportunities for conferring with the supervising teacher were necessary.

Boucher (1971) surveyed the status of teacher education programs in agriculture. He found that two-thirds of the agricultural education departments were in colleges of agriculture and one-third in colleges of education. He found that most institutions reimbursed cooperating teachers, while some provided fee waivers for cooperating teachers, paid mileage for student teachers to supervise occupational experience programs, and/or had summer experiences as a part of student teacher preparation. Most student teaching programs lasted 9.5 weeks.

Reynolds (1970), evaluating an agricultural education pre-service program, found that respondents felt sixty-six percent of their undergraduate courses were of considerable help. They felt introductory courses had little value but that advanced technical agriculture courses were very valuable. Student teaching was rated as valuable and adequate. Administrators felt teachers were competent in agricultural knowledge but lacked teaching skills.

Loreen (1971) in a later study found that almost all agricultural education majors studied agriculture in high school. Hillison (1973) developed a system for evaluating programs of vocational teacher education. He tested a model which could evaluate vocational teacher education programs. The components of his system were a description of the existing situation, an analysis of the resources available, a process and a product evaluation.

Hillison had students evaluate the classes and faculty for all courses required of a secondary education major. He also gathered data from graduates of the previous year. Graduates who were first-year teachers were observed twice and evaluated. They were evaluated by their students and peers and their immediate supervisors.

Hillison found that the first-year teachers who were observed were overly directive. He concluded that this study could be used for evaluating teacher education programs.

Dillon (1970) used a task force to develop recommendations for statewide vocational-technical teacher education programs. His group preferred that one agency be responsible for the total mission of vocational teacher education. It felt there should be state coordinating councils for teachers, a state master plan for teacher education, and that schools and industry must help provide experience for teachers.

Administrative problems in teacher education in agriculture were studied by Love (1969). He found that universities did the most funding of teacher education. Agricultural education programs profited when affiliated with both colleges of education and colleges of agriculture rather than with colleges of agriculture alone. Most respondents had written contracts for reimbursement from state and federal funds. Half were not asked to help develop state plans required by P.L. 90-576. Ninety percent said teacher educators had no supervisory responsibilities.

In summary, the studies reviewed judged student teaching programs to be acceptable. Undergraduate courses in technical agriculture revealed a reasonably high degree of acceptance by those enrolled.

STUDENT TEACHING

The research on student teaching ranged from examining the role of supervising teachers (Bass (1972) to personality related studies (Islam, 1970 and Miller, 1972).

Bass (1972) developed a list of behavioral activities in which supervisory teachers should engage. Long (1975) found that departments with student teaching programs were rated much higher than those with none.

McCracken (1976) surveyed the status of pre-service teacher education in agriculture. He found that most students taught for eight weeks and were awarded twelve quarter hours of credit. The median length of early experience was one week. Nine quarter hours of course work in agricultural education, excluding student teaching and early field experience, were required and 13.5 hours of education and psychology courses were required. Nine of seventeen institutions certified graduates in specialized areas of agriculture. Usually seventy-five quarter hours of technical agriculture and twelve months of occupational experience were required.

Other than the work by Boucher (1971), Chyung (1970), and McCracken (1976), very little systematic inquiry was evident in the area of student teaching programs.

Miller (1970) disclosed that apprenticeship programs can elicit change in teachers' attitudes and extent of self-actualization. He felt additional experiences through apprenticeship programs would help prepare vocational teachers.

Several years later Miller (1974) investigated the relationship between first year teachers' morale and behavior. He found a moderately negative relationship between student talk and teacher morale and between teaching load and satisfaction with teaching.

Ingvalson (1971) found that student teachers' attitudes toward the teaching experience improved during actual teaching. He also determined that high grades increased the likelihood of graduates seeking a teaching job.

Summary Comments on
Student Teaching

Student teaching programs continue to increase toward one full quarter. Very little formal course work in agricultural education is required beyond student teaching. About forty percent of the undergraduate curriculum consists of technical agriculture courses.

It was also revealed that during the first year of teaching, vocational agriculture teachers' morale was low as compared to the morale of other student teachers at the same grade level.

Problems of First Year
Teachers

Reed (1969), Wilson (1972), Lutovsky (1972), Miller (1974), and Webb (1977) all examined problems of first-year teachers. The general findings indicated that first year teachers' problems were not alarming. Problems of discipline and classroom teaching were reported to be minor. Additional development by the first-year teachers was needed. Here again, the research was predominantly survey-descriptive. No apparent attention was given to determining the effectiveness of current programs or their variations.

MISCELLANEOUS STUDIES

Treese (1971) investigated the effects of micro-teaching on attitudes, anxiety, and values of participants. He found that the use of micro-teaching improved participants' attitudes. Anxiety was reduced in females, pre-service teachers, and secondary level teachers.

Hedges (1970) found that the best use of video-tape was in the methods course prior to student teaching and that this technique contributed to the motivation of student teachers.

Dillon and Peterson (1971) learned that teachers who were video-taped twice during student teaching decreased their amount of teacher talk. However, student teachers who were audio-taped once and video-taped once increased their amount of teacher talk. Both groups began to ask more questions as a result of the techniques. It appeared that micro-teaching and video-tape techniques were used rather widely in the profession.

Moore (1975) studied the effectiveness of two groups of entry-level teachers of vocational agriculture. One group held four-year certificates and one group consisted of one-year certified teachers. Moore learned that the four-year certified teachers were more effective than one-year teachers when increase in knowledge was compared. Teacher educators' evaluations also favored the four-year teachers. However, high school students rated the two groups as similar.

Douglass, Horner, and Hoover (1976) determined that the use of the computer and Flanders Interaction Analysis effected significant change in teaching behavior and that student teachers liked this additional feedback. However, the cost provided a definite drawback.

McMillion (1973) found that a group which had experienced performance based instruction had somewhat more anxiety than the conventionally prepared groups. However, he did not attempt to compare success of the groups.

Bender and Yoder (1976) developed internship programs for present and prospective vocational agriculture teachers. This resulted in the implementation of such programs for pre-service and in-service teachers who were placed in industry. A full-time faculty person was in charge and was assisted by local vocational agriculture teachers.

Horner, Peterson, and Harvill (1969) evaluated approaches preparing high school students for non-farming occupations. Such approaches included related instruction, directed work experience, combination of both, and a control group.

Ahrens (1970) evaluated prepared lesson plans in vocational agriculture instruction. He concluded that the plans are effective and that the need for them may increase as teachers' time becomes more in demand.

Moore (1977) examined the effects of tape-recorded feedback on student learning and use of faculty time in agricultural education classes. Students were pleased with the tape-recorded comments on their work and felt that the instructor was interested in their progress. This procedure also required less faculty time than written comments.

Vaughn (1976) identified self-perceived levels of proficiency of three groups of FFA advisors: national emblem winners, superior chapters, and standard chapters. No significant relationship existed between perceived degree of proficiency and degree of success. He found, however, a significant relationship between participation in Alpha Tau Alpha and Collegiate FFA and success as an FFA advisor.

Bode (1972) studied abilities needed for successful teachers of vocational agriculture. The predominant criteria for success were: ability to maintain interpersonal relationships, dedication and industry, command of subject matter, varied and innovative teaching methods, involvement and cooperation in community activities, and selection of appropriate subject matter. Lack of success was caused by inability to maintain discipline.

Standards for Teacher Education

Oren, et al. (1977) reported on an ad hoc American Association of Teacher Educators in Agriculture committee study, "The Legitimization of Program Standards and Guidelines," which sought to determine if teacher educators in agriculture accepted the National Standards for Teacher Education in Agriculture and the Guidelines for Teacher Education, and how these standards and guidelines were implemented. A national profile, based on the results of the study, was later compiled.

Byler (1977) identified the needs of agriculture instructors in area vocational schools. He asked respondents to rate 105 competencies. All of the competencies were rated at least moderately important and helpful in designing in-service programs. The group of respondents preferred programs in area school in-service workshops.

Comments on the Miscellaneous Studies

These studies found that trainees respond favorably to video-taping. They also showed that conventionally prepared teachers can teach better than technically competent persons with no teacher education. It was indicated that audio-recorded comments on student papers saved time and were well received.

Summary

What are the results of research reported since 1970?

- Adequate lists of competencies needed by vocational agriculture teachers exist.
- Pre-service and in-service programs can be designed and evaluated using competence needs.
- The teacher education programs evaluated were perceived as credible.

- Teacher education as of 1969 was influenced by contractual agreements with state departments of education.
- Internships appear to be needed and helpful.
- Student teaching programs seem to continue very much as in the past.
- First-year teachers have few major concerns. However, morale of teachers of vocational agriculture does not compare favorably with the morale of other teachers.
- Micro-teaching and use of video-taping is a viable part of teacher training.

INSTRUCTION

EFFECTIVENESS OF MATERIALS AND METHODS

There were two broad categories of investigations in this area: effectiveness of student and/or teacher references and effectiveness of various teaching methods. The following are representative of this work.

McCarley (1969) studied the effect of individualized instruction and lecture discussion on teaching vocational agriculture. Miller (1970) compared the text and programmed learning methods of teaching. Peterson (1970) evaluated the effectiveness of audio-tutorial instruction in teaching small gasoline engines. Peterson (1970) examined six methods of teaching agricultural careers. Zurbrick (1971) studied a teacher reference utilizing an inductive mode and principles approach with high school vocational agriculture students. Bettis (1971) evaluated safety units in teaching safe use of power equipment. McCaslin (1970) examined the effect of field trips on student achievement. Howell (1973) studied the effects on students of a manual on environmental protection. McCormick (1975) and Jacobs (1970) evaluated various instructional units. Geesey (1976) studied instructional materials used in teaching tree identification and their relation to student achievement. Hernan (1977) found that programmed slide instruction did not improve tool skill development or subject matter knowledge.

Most investigators used experimental or quasi-experimental designs. They sought to determine effectiveness of the treatment in terms of post-test scores, gain scores, student attitude, and the like. Some

studies also examined such variables as years of experience, time devoted to the unit, and teacher preparation through formal technical courses.

Generally the investigations attempted to manifest significant changes in cognitive learning, attitudes, or levels of interest in short periods of time. Often the studies failed to support their hypotheses; mixed findings were common.

The predominant design was some form of pre-test/post-test control group. In general, appropriate designs were used in conjunction with sound methodology. However, some periods of only one week were utilized in many studies reviewed, thus posing serious cognitive problems.

What are the basic research findings in this area? The reader must note that all findings were rather isolated and offered little external validity. However, they do offer a basis for replication and further probing. The important points to note are:

1. Teachers spent less time planning for teaching when using most of the references studied.

2. Teachers needed in-service to use references appropriately.

3. Students using manuals often did not learn more than when taught without the manual.

4. Individualized approaches out-produced lecture discussion approaches.

5. Student interest was positively related to student performance.

6. There was a positive relationship between gain in knowledge and attitudes toward instruction.

7. Programmed learning was more effective than standard text learning.

8. Programmed slide instruction did not improve hand tool skill development or subject matter knowledge, or reduce instructional time.

9. Students did not gain significantly from field trips.

SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS

Among those studying this area of vocational agriculture were Travis (1970), Neavill (1973), Goos (1974), Leising (1976), McMillion and Auville (1976), Appleget (1977), Williams (1977) and Morton (1978). Most studies were descriptive and utilized mailed questionnaires. In the Review and Syntheses of Research in Agricultural Education Warmbrod and Phipps (1966) reported that programs of supervised experience in agricultural education had been justified because they motivated the learner and allowed for meaningful classroom instruction. They aided development of general skills and attitudes toward work. However, research based on these theories had been meager.

New research interest and activity emerged in 1977 and 1978 and the entire profession renewed commitment to the basic concepts of vocational agriculture. David Williams, at Iowa State University, provided the most direction to this area.

Travis (1970) sought to determine if high school graduates had worked in an occupation similar to that for which they were trained. He asked agriculture graduates to rate various aspects of their training and also on-the-job experience. Off-farm experience programs in agricultural business and agricultural mechanics were included. All students recommended an occupational experience program for others.

Goos (1974) studied production agriculture experiences for students with limited resources and found that fifty percent of the programs involved school farm operations. He concluded that it was important that the teacher be able to acquire resources either from the school or from other sources.

Leising (1976) surveyed school board members, administrators, teachers, and students to determine their perceptions of the concept of experience in agriculture and agribusiness education. The principle dealing with emphasizing real-life situations and experiences received the highest overall rating from the groups. Providing students the opportunity to earn money received the lowest.

McMillion and Auville (1976) examined success of supervised farming programs of high school students. They sought the factors related to successful supervised farming programs and the variables which contributed to farming programs success. The variable most associated with

successful experience programs was "teacher assists with fairs and livestock shows." Their most important variable was "teacher has a part-time job." This had been indicated as a negative influence. The third most important predictor was "teachers inform the administration of FFA and departmental activities." Other variables were: teachers had vocational agriculture in high school; nearness of the teacher's original home to present teaching job; and non-academic duties performed by teacher.

Appleget (1977) examined instructor supervised farming program visits. Each student and instructor were asked to express the degree of importance they placed on specific supervised farming program visitational procedures and activities. Students and their teachers perceived differently the role of the vocational agriculture teacher in conducting supervised farming program visits.

Neavill (1973) investigated the relationship between mastery on a criterion referenced test and program characteristics for tenth grade vocational agriculture students with two years of vocational agriculture. He found that students with high levels of mastery on animal science items tended to have more supervised experiences and usually had animal science projects. The same notion held in the area of agricultural mechanics and crop and soil sciences.

Morton (1978) investigated the quality of supervised occupational experience programs as measured by income, scope, and growth and achievement on a multiple-choice test covering technical knowledge in production agriculture. He found a positive relationship between achievement test scores and (1) quality scores of supervised occupational experience programs, (2) opportunity to engage in supervised occupational experience programs, (3) cumulative grade point average, (4) number of years of vocational agriculture completed, and (5) the number of project visits students received from their instructor in twelve months' time.

Briers (1978) evaluated instructional packets in supervised occupational experience programs for beginning vocational agriculture students. An experimental group used the special packet of materials while the control group received the normal units taught. He discovered gain scores on the knowledge test were significantly greater for the experimental group. The experimental group improved to some extent on attitude scores and more significantly on the planning scale.

Summary of Supervised
Occupational Experience
Programs (SOEP)

It was found that client groups such as school board members, administrators, teachers, and students subscribed to the principle of experience in agriculture education. Students rated the experiences at about a "B" level. Students judged programs to be better when teachers assisted with fairs and livestock shows, informed the administration of activities, had vocational agriculture in high school, lived near their original homes, were active in non-academic school functions, and did not have a part-time job. Students performed better on criterion referenced tests if they had corresponding occupational experiences. Furthermore, as the quality of students' SOEPs increased, so did their scores on agricultural achievement tests. This was true also for opportunity to engage in a SOEP, cumulative grade point average, number of years of vocational agriculture, and number of project visits received each year. Well-prepared instructional packets had impact on the quality of students' occupational experience programs.

ASSESSMENT OF OCCUPATIONAL KNOWLEDGE

Warmbrod (1974) was instrumental in developing criterion-referenced tests to measure performance of four specialized instructional programs: agricultural mechanics, horticulture, agribusiness supplies and services, and farm management. Content validity was established by using specified outcomes sought by the programs, the development of criterion-referenced items assessing the student's mastery of the prespecified outcome, and having expert teachers and local supervisors review the items.

Neavill (1973) assessed the competencies of tenth-grade vocational agriculture students who had completed two years of instruction in vocational agriculture. Few students correctly answered the majority of items on the criterion-referenced instrument. Fewer students demonstrated mastery on the leadership items and crop and soil science items.

Neavill further discovered that teachers over-estimated their students' degree of mastery. He also found that sixty-nine percent of the students who indicated an occupational choice chose agriculture. The students with an occupational choice scored higher than those

without a choice. Students who came from agricultural backgrounds, who had supervised experiences, and who planned to attend post-high school institutions achieved a higher degree of mastery on the test. Students who had projects in a subject area performed better in that area than students without such projects. FFA participation had a positive influence on leadership items. Rathbun (1974) also supported this finding.

Farrington (1974) conducted a similar assessment of twelfth-grade vocational programs in agricultural mechanics. He described the level of mastery of students who completed specialized agricultural mechanics programs in area vocational centers, completed vocational agriculture programs in local schools, and graduated from local high schools with no instruction in a vocational course. Over three-fourths of the students at area vocational centers correctly answered fifty percent or more of the items on his test compared to twenty-five percent of the vocational agriculture students in local schools and twenty percent of the non-vocational students.

Thus, it appears that criterion-referenced tests yield pertinent accountability and/or assessment information. The test items are available and can be used to assess program effectiveness and student mastery. Students in specialized programs master their area to a greater extent than students in local programs with no specialty emphasis. Vocational agriculture students' performance on the criterion-referenced tests was relatively low. Finally, teachers were not good predictors of their students' level of mastery.

Evaluation of College Training

Tom and Cushman (1975) asked 120 professors to identify seven general teaching objectives for undergraduate courses. Data were collected from instructors and students to determine the relationship between teaching behaviors and student achievement as measured by students' ratings. This work yielded four products: an instructor's print out, a computer program, an instructor's form, and a student form.

School Farms

Britton (1970) determined the use and value of school land laboratories in Colorado. Berninger (1972) examined a similar topic in Oklahoma. In Colorado, forty-eight percent of the vocational agriculture departments operated school land laboratories, which were usually thirty acres. Britton urged that laboratories be directed toward education rather than making money.

CURRICULUM

The most notable effort in this area was the "National Agricultural Occupations Competency Study" coordinated by David McClay and funded by the U.S. Office of Education. It identified and validated major production agriculture occupations and agribusiness occupations.

Mortensen and Stinson (1973) developed curriculum guides in natural resources for grades K-14.

Another major project was the two-phase "Curriculum Development Basic to the Training of Individuals for Employment in Agribusiness, Natural Resources, and Environmental Production" directed by Ridenour and Roediger (Phase 1-development of curriculum guides), and Warmbrod, McGhee, and Householder (Phase 2-curriculum guide field test), under contract from the U.S. Office of Education. McCracken (1975) determined the common core of basic skills in agribusiness and national resources under a grant from the Office of Education. A task analysis was completed by the VTECS consortium. Results of the work by this group are available only to members of the consortium.

The curriculum research in agricultural education clustered in five areas: task analysis, core curriculum, development of curriculum guides, evaluation of curriculum, and determination of employment needs.

TASK ANALYSIS

Much work has been completed in this general area. The McClay (1978) study provided occupational descriptions and validated competencies for firty-seven production agriculture occupations and 139 agribusiness occupations. The project was rather unique in that it involved researchers in forty colleges and universities. The study identified the agricultural occupations in seven broad instructional areas of agriculture; determined the competencies needed for entry employment and advancement; validated the competencies by persons employed in the occupation and by their work supervisors; and combined the work of all the states in a final publication, "National Agriculture Occupations Competency Study." Fifty leaders in agricultural education met to agree on how to complete the project. A complete

list of occupations was compiled; an approximate number of people employed in each occupational cluster was set and occupations were classified as skilled, technical and/or managerial, or professional. An employer/employee review group was selected to analyze the questionnaire for needed revisions. A national review group classified the importance of the competencies and summarized findings. The results were then combined and distributed nationally.

Grant (1971) identified mechanics competencies needed for skilled and semi-skilled laborers in horticulture occupations. Berkey, Drake, and Legacy (1972) developed a model for task analysis in agribusiness. Industry and education experts identified nine business areas and developed lists of functions and tasks performed within the business areas. Personal interviews were used to verify functions and tasks performed. Bishop, Amberson, and Richardson (1973) followed a similar procedure to determine the competencies needed in twelve agricultural mechanics occupations. Conteh (1974) identified curriculum content for occupational education. He examined procedures and techniques of acquiring occupational information. McCracken (1975) determined a common core of basic skills for agribusiness and natural resources through the use of task inventories. Additional work was completed by Hohenhaus (1976) in the retail feed industry and by Hampson, Newcomb, and McCracken (1976) on leadership and personal development competencies.

CORE CURRICULUM

Horner, Zikmund, and Dillon (1970) sought occupational commonalities to use in course construction. They asked workers to check knowledges and skills relative to their jobs. Bookkeeping and handling money were checked most frequently. More than a third of the workers checked business management, taxes, credit, marketing, soils, electricity, insurance, accounting, livestock, farm machinery, general agriculture, welding, tractor and other power, agricultural economics, inventory, salesmanship, first aid, and tractor mechanics. The investigators concluded that workers often need similar knowledges and skills.

Snowden (1972) sought knowledge and skills needed in agriculturally related occupations. He mailed questionnaires to agribusiness personnel, school administrators, vocational agriculture teachers, farmers and high school students. He reported that all items relating to curriculum content were rated as significant, but with varying amounts of emphasis.

Cox (1973) found that teachers of vocational agriculture used Oklahoma's basic core curriculum for sixty percent of their instructional time; students retained severty-five percent of the information.

McCracken and Yoder (1975) noted that decisions regarding which agribusiness and natural resources skills should be taught had been based on advisory committee input, task inventories, or community surveys. Most effort had been directed towards identification of competencies for specific occupations rather than basic skills utilized to orient students and provide them with exploratory experiences.

McCracken and Yoder constructed task inventories for agriculture occupations. After representatives of each occupation reviewed the items, surveys were conducted asking two questions: Does the incumbent perform the task? How essential is the task? The project yielded task lists for the twenty-eight occupations surveyed.

The work of Horner et al. (1970) also suggested areas common to all vocational agriculture curricula. These studies suggest that if a common curriculum is advanced, instructional time will reflect that curriculum.

CURRICULUM GUIDES

Mortensen and Stinson (1973) developed K-14 curriculum guides in natural resources. The following publications suggest a sequentially-developed education program offering career awareness, career explorations, and job preparation in the natural resources:

Natural Resources and Career Awareness
Exploring Occupations in the Natural Resources
Occupational Preparation in the Natural Resources
Natural Resources Technologies

Regional briefing sessions were attended by over 300 teachers, teacher educators, guidance counselors, school administrators and state agency personnel.

Householder, McGhee and Roediger (1976), led by Ridenour and Warmbrod, undertook the development and field testing of curriculum guides. The team identified major occupational categories within agribusiness, natural resources, and environmental protection. Specific occupations were compiled. These occupations were reviewed for completeness and representativeness of current or emerging occupations. Levels of

education which were appropriate for each occupation were indicated. Extant curriculum guides were analyzed for use in producing new guides. The ten guides developed contained information for administrative planning and instructional units for classroom teachers.

The field test monitored policies and procedures used in dissemination, monitored teachers' reactions to the guides, and assessed student achievement when the guide was used for instructional decision making. The third aspect of the field testing used criterion referenced tests.

Most dissemination strategy occurred via in-service workshops. Most conference participants favored the guides. Teachers who used the guides felt their greatest value was in determining teaching objectives, content and student activities. Assessment of student achievement revealed few significant relationships between the use of the guides and achievement on the criterion-referenced tests.

Curriculum guides have been well received by client groups. They can be built and modified to fit local needs. However, they cannot be expected to demonstrate increased student performance.

Curriculum Evaluation

The project discussed above was well designed and rigorous in nature. This evaluation of curriculum guides subjected the product to the ultimate test: improved student performance. Other curriculum ventures have not demonstrated performance by students. There is a need for more systematic and rigorous evaluation of curriculum efforts in agricultural education, aimed at student performance and/or employee performance. The Householder et al.study (1976) had limited scope, that is, using the guide to plan one unit, teaching one unit and assessing its measurable impact.

In another study, Dillon (1970) examined the relevancy of junior high vocational courses. He concluded that junior high courses had few exploratory occupational objectives. Gregg (1971) found that agricultural production was declining as the largest curricular offering. His respondents reported some special provisions for the disadvantaged, but no significant efforts. He also learned that one-hour classes were the norm.

Employment Needs

With the expansion into off-farm programs, availability of reliable work force data becomes an ever more critical problem in agriculture education. Few studies have been reported in this area.

Mannebach and Lownds (1975) conducted a survey of how employment opportunities and community resources reflect on programs of vocational agriculture. They determined that employment opportunities in Connecticut increased at a rate of three percent yearly.

Zurbrick (1976), studying employment trends in agriculture, revealed that job opportunities requiring skill and knowledge in agriculture increased by 20.6 percent from 1971 to 1974. Traditional production opportunities in agriculture decreased to less than fifty percent.

Legacy, Howell, and Richardson (1977) developed a model for employment needs assessment in agribusiness. They utilized mailed questionnaires and personal interviews. At this writing a final report was not available.

Generally, it can be concluded that insufficient data exists on sound program planning and general accountability.

Conclusions Regarding Curriculum Research

Agricultural educators have much well-developed information about task inventories (analysis) to aid in designing appropriate curriculum for agriculture education. Numerous curriculum guides exist to meet state needs. Furthermore, items common to several instructional areas ought to influence decision making. However, additional well-developed research on curricula is needed in determining personnel needs for the agriculture industry.

STUDENT SERVICES

SUCCESS OF FORMER VOCATIONAL AGRICULTURE STUDENTS IN COLLEGE

Despain (1970) compared college grades of former students of vocational agriculture with those of former non-vocational agriculture students and found no significant differences in their college grade point averages. Goecker (1974) studied the academic performance of agriculture students with and without high school vocational agribusiness experience. Fifty-five percent of those with vocational agriculture and forty percent of those without graduated in agriculture.

In a related area Autry (1969) found that junior transfer students in agriculture had low mean scholastic aptitude test scores, lower scores than any other department. Students from larger high school graduating classes scored higher than students from small classes. Overall, mean grade point averages were about the same for all students.

Davis (1977) determined that students transferring from two-year technical schools to the College of Agriculture at The Ohio State University were in the top half of their high school class and had ACT scores similar to students who initially enrolled in the College of Agriculture. Twenty-three percent dropped out or withdrew before completing the Bachelor of Science Degree. Overall grade point averages for transfer students were 2.32 compared to 2.73 for all students in the college. In agriculture courses, transfer students earned a 2.6 grade point average as compared to 2.84 for all agriculture students.

High school rank, ACT score, and technical school point hour were all positively related to the accumulative point hour ratio at the four-year college. Also, transfer students with associate degrees performed better than students who transferred before graduation.

The profession can conclude that students who were enrolled in vocational agriculture in high school will perform similarly to students who were not so enrolled. The same is true of students from two-year postsecondary institutions in four-year institutions and

students who initially enroll in the institutions. The grade point average in high school continues to be a good predictor of later academic performance.

OCCUPATIONS OF FORMER STUDENTS

A number of studies revealed that vocational agriculture graduates were quite successful in finding jobs though not always in agricultural areas.

Bass (1969) found that twenty-seven percent of former vocational agriculture students were in farming or related occupations while the rest were in non-agricultural occupations. Less than one percent were unemployed.

Bender (1971) has observed that common types of employment for agriculture graduates involved skills in mechanics or working with people. He also found that most students liked their experiences in vocational agriculture.

Richardson and McFadden (1975), in examining employment patterns of vocational graduates revealed that: most of the graduates sought full-time employment; it took about two months to get a job; sixty percent were working in their specialty area; eighty percent of the graduates were satisfied; and beginning wages were from $2.14 to $3.04 per hour. Richardson (1975) reported that significant influences on high school graduates' earnings were: (1) gender, (2) marital status, (3) year of graduation, (4) degree of satisfaction with present job, (5) labor union membership, and (6) length of time to find a job. The type of vocational program had no conclusive relationship to earnings.

Vocational agriculture graduates tend to have no great difficulty finding employment, usually in agriculturally-related areas.

RECRUITMENT AND RETENTION OF TEACHERS

SUPPLY AND DEMAND

Beginning with Woodin (1969) and more recently with Craig (1976), there is ample and continuous documentation of the shortage of qualified vocational agriculture teachers. This is the most pervasive problem facing the agricultural education profession. The areas of study associated with the problem are: use of time, salary and working conditions, why teachers leave teaching, and recruitment.

Attention given to the problem has not resulted in improvement in the supply of teachers of vocational agriculture. Some states have closed programs due to teacher shortages and others have left decisions of hiring non-certified persons to local administrators. In Iowa and Virginia there have been special summer programs for persons with bachelors degrees in agriculture but these programs provided pre-service teacher education during the summer preceding the opening of the secondary schools. Limited on-site follow-up during the first year on the job was also provided. Officials in Ohio utilized a trade and industrial education model of training to prepare teachers who were needed but otherwise unavailable. This program provided 128 clock hours of classroom instruction followed by bi-weekly visits and/or seminars during their first year of teaching. During the following summer these persons enrolled in university course work and were visited by a teacher educator about every three weeks during their second year. A four-year certificate was granted upon completion of the program. Yet, the profession is in general agreement that it wants regularly prepared and certified teachers.

Unfortunately, it is not known why high school students and undeclared majors in college do not major in agricultural education. Furthermore, the Craig study shows that the teacher education institutions prepare a sufficient number of teachers; however, fewer than sixty percent elect to teach. There are no prototypes of effective recruitment programs in existence.

Time Studies and Studies of Salaries and Working Conditions

Works by Handley (1974), Betz (1973), Dillon (1976), Leske and Peterson (1977), and others offer a similar picture. Vocational agriculture teachers usually devoted somewhere around fifty to fifty-five hours per week to their job. Most time was spent on the vocational program. Dillon reported that teachers devoted about thirty-one percent of their time to teaching activities, eleven percent to FFA, and six percent to supervised occupational experience programs.

Melton (1977) revealed that the beginning salary for new college graduates was from $580-$1,200 per month. New master's degree graduate salaries ranged from $740-$1,700 per month.

Thomas (1973) reported that in 1973 half of the states had vocational agriculture teachers on twelve-month contracts, but Melton reported that only nineteen states had such programs by 1977.

WHY VOCATIONAL AGRICULTURE TEACHERS LEAVE TEACHING

A number of studies found that vocational agriculture teachers left teaching for the following reasons: lack of opportunity for advancement, long hours, students in class who should not be in vocational agriculture, no long-range commitment to teaching, and inadequate salaries.

Thomas (1974) reported an eleven percent annual turnover in Minnesota. Allen (1976) studied why the average secondary vocational agriculture teacher in Oregon taught less than five years. Twenty-seven percent left because of salary, and thirty-eight percent left because they did not have enough time for their families. Forty-nine percent left to enter school administration.

Knight (1977) studied the reasons why former high school teachers of vocational agriculture left teaching between 1970 and 1975. He compared former teachers with teachers continuing in the profession. The five chief reasons reported were: (1) long-range occupational goals differing from teaching vocational agriculture, (2) lack of student interest, (3) inadequate advancement opportunities, (4) long hours, and (5) inadequate salary.

The turnover rate (ten percent) for vocational agriculture teachers is similar to the turnover rate which industrial personnel specialists advocate.

RECRUITMENT

Evans (1971) examined the factors that influenced high school students in Alabama to become teachers of vocational agriculture. Vocational agriculture teachers were the most influencial factor. He concluded that students who were active in FFA chose not to teach. Additionally, he reported that students who entered teaching received more home visits from their vocational agriculture teachers.

Fletcher (1974) found that items rating high in influence to become teachers were parents and opportunity to work with youth and livestock. Salary and opportunity to farm ranked very low. Individual experience in vocational agriculture and the opportunity to observe at special events greatly influenced job decisions while brochures and bulletins did not.

Luft (1974) conducted a study of guidelines for teacher recruitment programs. He collected data from head state supervisors, teacher educators, and students in agricultural education.

Thirty-seven percent of the student respondents had studied vocational agriculture in high school for four years; twenty-seven percent had not. Few had a farm background. Most state supervisors felt that teacher recruitment was the responsibility of state supervisory teacher educators, and vocational agriculture teachers. Thirty-eight percent of the teacher educators felt recruitment was their sole responsibilty.

Common recruitment practices were: (1) personal interviews with an agricultural education professor, (2) university tours, (3) teaching units on opportunities in agricultural education, (4) displays, and (5) brochures. Luft recommended the following guidelines for recruitment programs:

1. Develop a program within the policies and philosophies of teacher educators and state supervisors.

2. Make efforts for supervisors and/or teacher educators to interview any possible agriculture teacher candidates.

3. Make available a teaching unit on opportunities in agricultural education for use by local vocational school and college instructors.

4. Encourage prospective candidates to tour the university campus and agricultural education department facilities.

5. Let vocational agriculture instructors know they are the most influential person in a student's choice of agricultural education as their major.

6. Encourage vocational agriculture instructors to recruit good students for their program.

7. Encourage membership in the FFA since FFA is an influencing factor.

8. Rely primarily on vocational agriculture as the subject influencing a student's choice of agricultural education.

9. Use form letters and the news media only as a last resort.

10. Provide occupational information concerning agricultural education to all high schools when feasible, and to vocational agriculture departments.

11. Distribute this literature to parents of prospective candidates.

12. Provide literature to vocational-technical schools and colleges that have technical agriculture programs.

13. Make efforts to recruit students from vocational-technical schools, community colleges, and junior colleges.

14. Develop a program that will provide continual contacts with prospective candidates.

15. Evaluate all possible sources of recruiting agriculture teachers in the state.

16. Assign to individuals in teacher education and on state staffs the responsibility of recruiting.

17. Employ students interested in vocational agriculture as teacher's aides, lab assistants, or tutors since employment experiences are factors influencing their choice of college curriculum.

18. Establish a recruitment committee in every state that can continuously evaluate each state's practices.

19. Use research data to develop recruiting programs.

DISADVANTAGED STUDENTS

Of the studies in this area very little can be reported that would be helpful to the reader. If the scarcity of research on the disadvantaged is an accurate indication of agricultural education's interest in providing programs for the disadvantaged, this is, indeed, most unfortunate.

The most notable work in this area was by Curtis (1973). He developed teaching units for teachers working with educationally disadvantaged students. The schools used in the study were visited prior to the field test and then again while the materials were in use. The project staff reported that the instructional materials developed were appropriate for disadvantaged students. Performance and achievement test scores for the disadvantaged students compared favorably with scores for more advantaged students on all three units.

During the second year of the project additional units were developed and tested. Additional products available were a guidance publication, ten slide-tape sets, and nine super-8 mm film loops.

Lambert (1971) examined educational practices and techniques of teachers of programs for disadvantaged students and teachers in programs for regular students. He found that teachers of the disadvantaged considered the following less important than did regular vocational teachers: (1) work with students in out-of-school activities, (2) use the school room in assigning grades, (3) require good discipline in class, (4) use role playing, (5) ask many factual questions, (6) use chalkboard and overhead projector, (7) review tests after grading, (8) use students' experiences in class discussion, and (9) require a student notebook.

Teachers of disadvantaged students considered involving the students in setting the rules for the class more important than teachers of regular students. Teachers who had taken courses in teaching the disadvantaged considered the following more important than teachers who had not taken such courses: (1) counsel with students, (2) plan a course of study in consultation with other teachers, (3) develop supplemental teaching materials, (4) correlate mathematics, English, and science with vocational subjects.

Thompson (1971) collected data from students enrolled in programs for the disadvantaged. He found that most students were new to vocational agriculture programs; they participated little in extracurricular activities; and that those with occupational experience were far more likely to enroll for career reasons than those who had no occupational choices.

Byrd (1972) examined the effects of a task analysis model with behavioral objectives on the cognitive and psychomotor learning of educationally disadvantaged students. He found no treatment differences for these students.

Miller and Strickland (1972) followed up teachers who were enrolled in a three-week institute for teachers of the disadvantaged. Seventy-five percent of the teachers held favorable attitudes toward the practices which had been suggested while twenty-two percent did not. They concluded that better programs for the disadvantaged would include smaller classes and improved communication.

Carlile (1975) studied methods of teaching agricultural mechanics skills to the educable mentally retarded. He studied a sequentially oriented teaching method and a standard teaching method. There was no significant difference between the two methods when the dependent variable was cognitive learning. However, the experimental treatment was superior in acquisition of psychomotor learning.

Carlile also examined the effect of time of day on cognitive and psychomotor learning. Morning classes scored highest on cognitive learning, but no difference was seen in the acquisition of psychomotor skills.

PROGRAM PLANNING

ADVISORY COMMITTEES

Mulvana (1971) sought the distinctive features of effective and ineffective vocational agriculture advisory committees. He found that six of the activities evaluated by respondents to a questionnaire were moderately related to the effectiveness of advisory committees. They were: (1) securing jobs for graduates, (2) locating training stations for students, (3) studying community needs, (4) obtaining funds from private business for the educational program, (5) explaining the agricultural education program to the community, and (6) evaluating the program.

He also learned that in effective committees: administrators participated in committee activities; ex-officio members included school administrators, supervisors, and school board members; school board members were included as regular members; no geographical areas in the school district were represented on the committee; and records were kept concerning minutes of meetings, recommendations, and curricula.

Effective committees appointed members for three-year staggered terms; involved individuals other than the teacher in nominating, appointing and notifying new members; and members served two or more consecutive terms. Effective committees met more often, held more special meetings, and were more likely to elect officers than did ineffective committees. In ineffective committees, the agriculture teacher did much of the work, presided over meetings, and the like.

A study by Faulkenbery (1976) showed that seventy-two percent of vocational agriculture teachers had advisory committees. The committees met an average of twice per year and had five members. Eighteen percent of the committees had constitutions and over forty percent kept minutes. Important activities included assisting in program evaluation, making program development recommendations, and influencing people.

Reid (1972) found that thirty-seven states had advisory councils prior to the 1968 Act; by 1969 ninety-four percent of the states had such councils. Seventy-seven percent of the councils had eval-

uation committees; two-thirds had written evaluation plans for one-year and one-fourth had a two- or five-year plan.

Guidelines suggested for councils in evaluating their performances included: (1) the improvement of vocational education, (2) the evaluation of state plans, (3) checking for implementation of vocational acts, (4) advisory councils as independent evaluators, (5) development of council staffs knowledgeable in evaluation, (6) the development of a formal evaluation plan by the council, (7) establishment of evaluation criteria, and (8) opportunities for councils to discuss evaluation procedures.

Administration of Multiple-Teacher Departments

Roberson (1971) examined and summarized practices used by all schools in Oklahoma which had two or more teachers of vocational agriculture in 1970-1971. And Brown (1976) advanced guidelines for operation of multiple teacher departments.

Pre-Vocational Programs

Budke (1970) identified thirteen major ongoing junior high pre-vocational programs. His study revealed that these programs were relatively new and exhibited many different characteristics and forms. Most programs used one-sixth of the total class time for occupational orientation.

FFA MEMBERSHIP AND PARTICIPATION

Welton (1971) studied student characteristics and program policies in relation to participation in FFA. He presented a number of conclusions:

1. Participation in FFA activities increased the longer students were enrolled in vocational agriculture.

2. FFA members with a higher socioeconomic status participated in FFA activities more than students with lower socioeconomic status.

3. In general, vocational agriculture students with lower grades in high school participated more in FFA activities

and school organizations than students with higher academic records.

4. Participation increased as chapters provided the opportunity to participate in the local program of activities.

5. Participation in FFA activities also increased as chapters allowed the membership to assume leadership positions within the chapter.

6. Non-members, and to some extent FFA members, perceived the organization as primarily for students who plan to farm.

7. Improvement of the FFA image was a major problem recognized by vocational agriculture teachers and students who were not members.

8. Vocational agriculture teachers believed changes in contests and awards would attract more vocational agriculture students into FFA.

9. Both members and non-members believed an increase in interest shown by members would improve FFA.

10. FFA members believed more appropriate activities would interest a higher percentage of the membership.

11. FFA members indicated that they mainly joined FFA to participate in FFA activities. They were influenced principally by friends, FFA advisors, and FFA members.

12. Non-members indicated they did not join or remain in the FFA primarily because of involvement in other school activities and community organizations and because chapter meetings were scheduled at inconvenient times.

13. Non-members indicated they would be more inclined to join FFA if chapter activities suited their interests and if meetings were held at more convenient times.

14. Nine out of every ten vocational agriculture students were male. White enrollment outnumbered minority group enrollment by four to one.

15. Nearly half of the students received mostly Cs for all high school course work.

16. Vocational agriculture students with occupational experience activities were involved primarily in production of agricultural products.

17. FFA was seen as necessary to the vocational agriculture program by nine out of ten vocational agriculture teachers.

18. Nine out of ten vocational agriculture departments included production agriculture in course offerings.

19. In the Central and Southern Regions, nearly nine out of every ten vocational agriculture students were FFA members; however, in the Pacific Region, only five out of every ten were members.

Blackledge (1972) sought selected factors which influenced FFA membership of vocational agriculture students. A questionnaire was administered to vocational agriculture instructors who were divided into three groups according to the percentage of their vocational agriculture class who were FFA members: Group I had 100 percent membership; Group II seventy-six to ninety-nine percent; Group III seventy-five percent or less.

Group III instructors had a thirty-four percent larger enrollment than the other two groups; eighty-three percent more females; sixty percent more town students; more non-traditional programs; held higher academic degrees; had more years of experience; and spent less time on FFA than the group with 100 percent membership.

MISCELLANEOUS STUDIES

Foreman (1973) found that students in early placement programs had better attendance, punctuality, safety records, followed regulations better and were better able to adjust to employment after graduation. Students on early placement were offered and accepted more advancement opportunities than other graduates.

In Florida (1973) a study was conducted to provide data for improving county programs of vocational agriculture. The study revealed that in 1972 production agriculture had the highest demand for workers, followed in order by horticulture, products, supplies and

services, forestry, and mechanics. In 1975 production agriculture was again expected to employ the most workers, resources the least; and the other segments ranked the same in 1972. However, production agriculture was expected to decline and all other segments to increase. The biggest increase was expected in resources. The next largest gain was projected for mechanics, followed by horticulture and supplies and services. Small increases in forestry and products were also expected.

Summary

Research on advisory committees has reinforced the common recommendations in the literature and provides a basis for decision on utilizing such groups. In the area of operating multiple teacher departments, several sets of guidelines and suggestions are available. These suggestions could be included in appropriate courses, seminars, and the like.

Welton's research suggested that FFA members would participate in FFA activities if many varied assignments were provided to capture the interests of a broad spectrum of students, and if many leadership positions were made available. There is a need for activities in FFA appropriate to the specialty interests of students as well as appropriate to their cultural and social interests.

While the study conducted in Florida (1973) provided important data on work forces, the nation as a whole appears to continue to search for answers.

EVALUATION STUDIES

Studies presented in other sections of this paper also have implications here, but were presented in the areas of their primary subject matter.

Assessment of Programs

Harris (1973) examined the pre-service program for teachers of vocational agriculture at Oklahoma State University. He reported that student teachers felt their training was effective but that an appraisal system was needed for cooperating teachers. They also

wanted to know the basis for evaluation, and the weighting given to university staff visits. Updyke (1974) found that new teachers felt they had at least minimum competency, yet they desired improvement of their professional capabilities.

Eslinger (1974) assessed cooperative work experience programs in Oregon high schools. He concluded that: (1) all vocational agriculture departments should adopt such programs, (2) all schools should plan their selection of students, (3) the instructor should make the final selection, (4) each student should have a signed training agreement, (5) each school should plan to select work stations, (6) adequate supervision should be provided, and (7) in-service and pre-service instruction was needed.

Assessment of Student Performance

Most work in this area was directed by J. Robert Warmbrod of The Ohio State University. In 1974 he directed a project which developed criterion-referenced instruments for the assessment of specialized vocational agriculture programs. Also, Warmbrod (1973) compared the competencies of students in area vocational schools who had or had not studied vocational agriculture in grades nine and ten.

Neavill (1973) conducted a criterion referenced assessment of ninth and tenth grade instruction in vocational agriculture. Following this, Farrington (1974) conducted a criterion-referenced assessment of twelfth grade vocational agriculture programs in agricultural mechanics. (Mentioned in "Assessment of Occupational Knowledge.")

COST ANALYSIS STUDIES

Cost analysis studies reveal that nearly all vocational programs have desirable benefit-cost ratios. However, the program's setting does not seem to produce discernable differences in benefits accrued to graduates even if costs differ. Findings confirm the importance of appropriate placement following graduation.

The majority of research in this area has been thoroughly and clearly done. See Osburn's work at Missouri, Richardson (1972), Yoder (1976), and Palmer's work (1976) as examples.

Burgett (1970) developed a procedural model for making effectiveness/cost evaluations of occupational education based on a review of the

literature. He then selected a program of occupational education to use as a case study. Program objectives were developed for each area of instruction, appropriate behaviors resulting from achievement of the program objectives were identified, and instruments were developed for measuring these behaviors and for measuring operating costs. These measures were incorporated into questionnaires for graduates and employers, field tested, and revised accordingly. Occupational program graduates of 1969 served as the population for Burgett's study.

Burgett advanced a number of suggestions: (1) limit the evaluation before attempting to solicit objectives, (2) clarify who should list the program's objectives, (3) have objectives written by the persons who operate the program, and (4) identify pertinent behaviors. Burgett stated that, at this point, the means for measuring the presence of behaviors should be apparent by inspection of the behavior's nature. The self-administered questionnaire method is not recommended for this type of study. Measurement of characteristics of graduates requires several years for expected behaviors to develop. The costs of this evaluation are minimal and normal expertise is required.

Burgett concluded that his model would aid creation of an effectiveness/cost evaluation instrument, and that it could be used in evaluating educational programs.

Patterson (1970) found that graduates of technical agriculture programs averaged $549 per month in agricultural supply occupations and $433 per month in agricultural mechanics occupations. These earnings were higher than for peers who graduated with no technical agriculture training. No differences in job satisfaction or fringe benefits were reported.

Osburn and Andre (1971) examined the effect of job-related training on earnings for vocational graduates. Their results showed that graduates who obtained first jobs in the category for which they were trained earned more per week than those who obtained jobs unrelated to training. Benefits of job-related employment increased over time.

Chumbley (1972) conducted a cost analysis of selected vocational and technical education programs by computing costs for those programs which were then critiqued by a panel of Oklahoma public school administrators.

The panel felt the average costs were representative and would serve as a guideline for the cost of vocational and technical education programs in Oklahoma.

Richardson (1972) determined the per student cost of two years of junior college vocational-technical education, the economic benefits to the students, and the cost-benefit relationships of such programs. He estimated cost data for seven vocational program areas. The program areas were agricultural business and industry, business and office occupations, data processing and computer science, distributive education, health occupations, public service related occupations, and trade and industrial occupations.

Richardson found that annual benefits accruing to students completing vocational programs ranged from $320 for agribusiness to $4,310 for public service related occupations. The benefits among all schools and program areas were $1,886. All programs were found to be favorable investments.

Yoder (1976) compared the cost/effectiveness of selected vocational education programs offered in local high schools and area vocational centers in Ohio. He found that all students had comparable socioeconomic backgrounds, academic grades, aptitude scores, and intelligence scores. There were no significant differences between the graduates from area vocational centers and local comprehensive high schools regarding: (1) time required to secure initial full-time jobs after graduation, (2) graduates' perceptions of how jobs related to the vocational programs completed, (3) graduates' perceptions of their preparation for jobs since completion of the vocational programs, (4) overall job satisfaction, (5) job level progression, (6) job stability, and (7) involvement in community activities. He found that graduates from area vocational centers had been employed a greater percentage of their time since graduation than local high school graduates.

Graduates from local high schools initially earned more on their first job after graduation than vocational center graduates. There was a significant difference between the annual per pupil costs for the vocational programs in local high schools and area vocational centers. Yoder concluded that the investment of funds in both types of programs was economically feasible.

Longbrake (1976) examined the benefits and costs of selected vocational education programs in an area vocational center in Ohio. He reported that vocational education programs were effective in terms of both monetary and non-monetary benefits.

Palmer (1976) studied the benefits and costs of an educational investment in small businesses. He analyzed sixty businesses which had completed one or two business analyses. He chose to analyze the added return to the individual of capital, family labor, and management and added gross sales to the community.

Palmer found that for the sixty small business entrepreneurs enrolled during the years of 1974 and 1975, their economic benefits exceeded their participation costs by about twelve to one.

Summary

The focus of the studies in this area vary somewhat, but it appears that reasonable models are available for conducting studies in this area. Investment in vocational programs are economically sound as benefits exceed costs in all studies reviewed. Job placement is important and affects returns to investment. Highly specialized vocational agriculture programs in area centers cost more than programs in local schools but the returns to investment are good in both programs.

ADMINISTRATION AND SUPERVISION

A very significant work in this area was the National Standards Project conducted at Iowa State University (1977). The first part of this project dealt with occupations requiring education in agriculture/agribusiness; part two dealt with the competencies needed for these occupations (McClay, 1977); and part three dealt with developing a set of standards for agricultural education. The Department of Agricultural Education at Iowa State University validated a preliminary set of standards and developed a plan for dissemination and implementation.

Standards that are currently available are those: (1) common to all programs, (2) specific to agriculture education at the secondary and post-secondary levels, (4) specific to administration and supervision, (4) specific to teacher education, and (5) specific to adult education. They need to be reviewed and adopted in each state in order to upgrade programs at all levels.

This work will add a needed dimension if used by leadership in all states. It can serve as the basis for improvement and as a point of departure for a new era of policy, programming, and evaluation research.

The educational system model of Copa (1970) was composed of three major components: inputs, process, and output. The model hierarchically and categorically organized the specific inputs and provided a method of separating the relevant and non-relevant inputs regarding production of an educational system.

The Minnesota farm management program was used to test and demonstrate the feasibility of the model. Copa found that within the limitations of his study the input identification model could be used to identify important system inputs.

Anthony (1972) studied local high school supervisors of vocational education in Tennessee. He found that local school districts with an enrollment of 5,000 or more had local supervisors of vocational education, hired both on a daily and a yearly basis. New supervisors who had masters degrees, between one and ten years of teaching experience, and training in an area of vocational education were preferred. The superintendents surveyed agreed on the duties which should be performed, but teachers did not agree on the duties local supervisors should perform.

Householder (1976) studied the perception of the role of local supervisor of vocational agriculture. He surveyed vocational teachers, school administrators, local and state supervisors of vocational agriculture and teacher educators in agricultural education in Ohio in order to obtain their views on the subject.

He attempted to measure the participants' perceptions of whether or not the local supervisors of vocational agriculture performed certain supervisory tasks; whether or not the supervisor should perform them; at what schools in the planning district the tasks were performed; and at what schools the tasks should be performed. He found a lack of consensus among the groups surveyed concerning the actual and expected role of the local supervisor of vocational agriculture.

Edsall (1970) sought to determine whether the advantages attributed to area vocational schools held when their programs were compared with programs in local schools. He gathered data from vocational agriculture teachers, counselors, faculty members, and vocational

agriculture students. He found that joint vocational schools offered more specialized vocational agriculture programs than local schools. Vocational agriculture students in the joint vocational schools had distinct and identifiable characteristics which distinguished them from students who were enrolled in vocational agriculture in local high schools. Vocational agriculture students in joint vocational schools had higher current grade achievement in all subjects. Fewer anticipated obtaining further education after graduation than did vocational agriculture students in local schools. Edsall also found that more and better guidance was provided to vocational agriculture students in a joint vocational school. In addition, the image of vocational agriculture was rated higher by faculty members and vocational agriculture students at the joint vocational school than by the same groups in local schools.

Saville (1973) investigated problems associated with incorporating vocational agriculture into area vocational schools. He found that the typical vocational agriculture instructor was not consulted when facilities were built or rooms assigned for specific use in preliminary planning. Scheduling classes of vocational agriculture was a significant problem. Relocation of vocational agriculture to the area vocational school was a favorable influence on the student-learning process and on agriculture enrollment.

Strong (1973) evaluated summer programs of Idaho vocational agriculture instructors. FFA activities accounted for seventeen percent of summer time, project supervision and home visits took sixteen percent of their time, and six percent of their time was devoted to community service. Teachers in his study made an average of sixty-five visits and averaged about forty-three hours of work per week.

Cepica (1977) determined administrators' perceptions of selected aspects of summer programs in vocational agriculture. He found that the teachers were in agreement on the relative importance of summer activities. Teachers in programs judged to be superior showed more activity than other teachers. The administrators wanted the teachers to plan the program and keep the administrators informed. Teachers and administrators regarded summer programs as highly important to the total vocational agriculture program.

Ford (1970) investigated what constituted a strong summer program and how it related to the total program of vocational agriculture. He found that ninety percent of the summer programs in Iowa which were rated highest by state agricultural education consultants were

full-time departments. There was a positive relationship between adult and day-school enrollments and improved ratings. Seventy-three percent of the departments that rated highest on summer programs also rated highest on the total program; eighty-nine percent of the programs which rated lowest on summer programs rated lowest on the total program. There was a positive relationship between rating of summer programs and extent of involvement in contests. The highly rated programs conducted twice as many instructional field trips, had twice as much media coverage, traveled more, had more state fair exhibitions, and averaged higher labor incomes.

Lantis (1975) also examined summer programs in vocational agriculture. He found that sixty percent of the teachers were employed at least eleven months. More than three-fourths of the teachers had no set work schedule. They held an average of two planning meetings and submitted three reports per summer. Thirty-five percent of their time was devoted to supervisory activities. The teachers felt holding FFA meetings was the most important activity. Teachers and administrators felt program management was most important to overall program development. They rated public relations least important. Teachers' and administrators' perceptions differed on work schedules, planning meetings, and reports required.

Robinson (1976) found that teachers appeared to be swapping night and weekend activity during the academic year for extended contract days which in some cases equalled the entire extended contract period. For teachers in one to ten days of extended service, the State FFA Convention and Vocational Agriculture Teachers' Summer Conference consumed all of their extended service. Supervision ranked highest as an extended contract activity but twenty-three percent of the respondents performed no supervision of students' occupational experience programs. Teachers said they spent five percent of their time on curriculum; four percent on courses of study; 1.6 percent on lesson plans; and about seven percent on teaching aids and materials. FFA activities ranked fourth in spite of the fact that forty-four percent of the teachers held no officer meetings and thirty-five percent held no FFA meetings. In general, as extended contract periods increased, teachers participated more in all activities surveyed.

Bakken (1972) investigated the attitudes toward teacher aides of Minnesota vocational agriculture instructors and superintendents of schools. Teachers all agreed that aides could share the duties of vocational agriculture departments and effectively work with

students. Fifty-eight percent of the superintendents indicated interest if salary could be reimbursed at suitable levels. However, Bakken felt that salary levels suggested were so low that the the program would never be initiated.

Braker (1973) assessed the image of FFA as perceived by current active members and advisors. Local members felt they needed more involvement with the selection of National FFA Officers and more awards in agribusiness. They felt there was a lack of involvement, interest, and participation. The groups agreed that the development of leadership, citizenship, and cooperation was still the major foundation of the FFA program and that FFA was an integral part of the vocational agriculture program. They felt more communication was needed between the local, state, regional, and national levels.

Drake and Morgan (1973) examined the perceptions of Alabama superintendents and principals toward vocational youth organizations. Twenty-one percent of the respondents felt students should be required to join the appropriate vocational youth organization. There was general agreement that the vocational youth organization should be an integral part of high school vocational education, encourage scholarship, and provide a guidance function for students.

Lindley (1974) found that teachers and directors of occupational education centers generally did not understand the aims and purposes of vocational youth organizations. He suggested there be more pre-service and in-service training of teachers and others. Most directors felt the vocational youth organizations were not adequate and needed more student involvement. Lindley also found the groups did not feel there could be one organization for all vocational students and they felt leadership could not be effectively taught in the classroom.

Summary

The research related to administration and supervision of vocational agriculture has been sparse and scattered. The most substantial work was in the National Standards Project conducted by Iowa State University (1977). The broad base of input utilized makes this work extremely relevant and useful for the profession.

The scarcity of research on local supervision of agricultural education programs suggests this is an undeveloped concept. There appears to be room for substantial role clarification.

Area centers for vocational education represent a tremendous allocation of financial resources, yet little documented evidence of their effectiveness or impact exists.

The research on twelve-month programs (as an endangered species) is sparse considering the impact this erosion could have on vocational agriculture programs. Little has been done to justify the necessity or effectiveness of twelve-month programs.

The research reviewed on youth organizations either asked the evident questions or did not go far beyond the surface.

ADULT EDUCATION

GENERAL STUDIES

Hollenback (1975) surveyed farmers and vocational agriculture teachers in Oklahoma regarding the need, feasibility, and possible acceptance of an adult agricultural education specialist program. His study revealed that the average farmers surveyed were forty years of age, that they had been farming more than ten years, and half had been enrolled in one or more years of college. About eighty percent of the farmers had been active in an organized young-adult farmer group within the past five years, however, forty-two percent did not have an organized program in their local community at the time of the study.

Over ninety-six percent of the respondents indicated they felt there was a need for organized, systematically scheduled short courses.

The teachers said ninety-six percent of the local administrators were in favor of young-adult farmer activities. Almost all farmers who did not have an ongoing program reported that they would be willing to organize a program if there would be adequate and capable instructional assistance available. Ninety-seven percent of the teachers said they would be willing to coordinate adult programs conducted by specialists as a part of their total vocational agriculture program. Ninety percent of the respondents felt vocational agriculture teachers needed assistance from some source, preferably a subject matter specialist. Ninety-five percent felt

that subject matter specialists would produce more effective programs. Less than half of the vocational agriculture teachers favored employing a second vocational agriculture teacher to assist in young-adult farmer education; while ninety percent favored the use of subject matter specialists.

Bail and Cushman (1975) developed procedural models for conducting adult education courses. Fifty-two programs were visited and the common characteristics of courses were recorded and analyzed. A set of procedures and guidelines for conducting adult courses was then developed and field tested.

These investigations revealed that adult education courses fit one of three models: self-fulfillment, business management, or employee training. Procedures and guidelines for each model included the following sections: purpose, clientele, recruiting, and instructional needs. The study also produced a kit of self-help materials to aid the prospective teacher.

Brownsworth (1969) determined the socioeconomic characteristics of adults in area schools. He found that the clientele were mostly males, with a mean age of thirty-three years. Over ten percent had completed grade twelve or higher; ten percent were from minority groups; sixty percent were unskilled; and seventy-two percent were upgrading themselves.

Purcell (1977) then studied the factors affecting establishment of young farmer programs. He determined why agricultural occupations teachers established young farmer programs. He then held a workshop to encourage the development of these programs.

Kiesling (1971) investigated the vocational agriculture teachers' attitudes toward coordinating and advising the young farmer organization and their attitudes toward other duties. He measured vocational agriculture teachers' attitudes toward eleven of their major duties and also had the teachers evaluate their success in their duties.

He found, among other things, that teachers' attitudes were highest toward advising FFA and toward their self-evaluated level of success. They favored coordinating and advising the young farmer organization but received low scores on success. Coordinating and advising the young farmer organization ranked ninth on attitude and tenth on self-evaluation scores. He concluded that this duty was not fully accepted as an area of responsibility by the vocational agriculture teacher.

Steakley (1972) identified the characteristics contributing to the success of young farmer chapters in Texas. Performance ratings were provided by area supervisors of vocational agriculture. Chapters rated on being highly successful by area supervisors possessed characteristics distinctly different from those rated as being less successful. The successful chapters had: (1) advisors who attached great importance to young farmer chapters, (2) younger members, (3) more members that had completed high school and college, (4) more members that were engaged in an agricultural occupation other than production agriculture, (5) more meetings concerned with production agriculture, management, and agricultural mechanics, (6) larger membership, more members in attendance at area and state meetings, more community service activities, more resource persons used for teaching young farmer classes, and (7) more teachers of vocational agriculture in schools.

EVALUATION STUDIES

Leske (1970) developed and evaluated two systems of electronic farm record keeping which provided cash flow data on a monthly basis, income tax information, and the analysis information available in the Minnesota Vocational Agriculture Farm Business Analysis. The two systems used were: a monthly system which used expense and income forms and a check system which used a check voucher and cash transaction form.

The two clearest advantages were that income and expense for the month and year to date were known, and that information was kept current. Regimentation, item identification, and error corrections were problem areas.

Purcell and Hemp (1975) studied adult programs in agriculture in high schools. They found that the number of such courses had declined from 485 in 1959-1960 to eighty-six in 1972-1973. The major reasons for this decline, as given by teachers, were (1) low reimbursement from the state, (2) inadequate pay for teachers, (3) lack of teacher time, and (4) the increase in adult education offerings in community colleges.

They also learned that more than ninety percent of the teachers utilized course committees to plan and organize courses. More than half the respondents were securing definite enrollment, visiting class members on the farm or on the job, using special teachers, and using outside speakers.

Starling (1976) has for several years prepared a report for Ohio farm business analysis teachers designed to give them state averages which they could use in teaching. Averages for selected measures were generated from 403 farm business summaries. His reports included: (1) the average capital investment per farm; (2) the increase in land investment; (3) the average gross income per farm; and (4) the average net farm income.

Summary

The studies reviewed in the area of adult education in agriculture included the following: (1) determining the need for programs, (2) developing procedural models for conducting programs, (3) analyzing the socioeconomic characteristics of the clientele, (4) examining characteristics of successful young farmer chapters.

Based on the individual studies reviewed we know that (1) teachers and young farmers feel full-time subject matter specialists should be used in adult education in agriculture, (2) there is a procedural model for conducting adult programs available from Cornell as well as a publication on teaching tools for adult education, (3) teachers in Oklahoma rank young farmer work and their self-evaluated success in that area low, (4) successful chapters in Texas had younger members, more high school and college graduates, and more ongoing activities than less successful chapters, (5) Minnesota has an electronic farm records system, (6) adult programs in Illinois declined from 485 to eighty-six in thirteen years, and (7) farm analysis results can be used to stay informed and to teach others.

POSTSECONDARY AGRICULTURAL EDUCATION

PROFESSIONAL EDUCATION COMPETENCIES NEEDED BY POSTSECONDARY AGRICULTURAL EDUCATORS

Feck (1971) examined the characteristics of teachers of agriculture in two-year technical institutions or colleges. He found that most teachers: (1) had a B.S. degree in a specialized area of agriculture and a M.S. degree in agricultural education, (2) had guidance responsibilities, (3) had taught at the technical level for five years,

(4) had eight years of industry experience, and (5) taught sixteen hours per week.

Schlicting (1972) identified the professional and technical needs of postsecondary teachers of agriculture. He also found that postsecondary agriculture instructors had strong agricultural education backgrounds with half holding B.S. degrees in agricultural education and sixty-four percent holding M.S. degrees in vocational education. Most of the instructors had part-time or full-time business and industry work experience. He found that class and lab responsibilities received the highest percentage of the instructor's professional attention. Teacher educators and the appropriate postsecondary administrators should find the work of Erpelding (1972) and Feck (1971) helpful in identifying professional needs of their faculty.

Jensen (1974) studied the professional functions, tasks, and competencies deemed important for Wisconsin postsecondary agriculture instructors. He identified 121 professional competencies from the literature and had a jury of twelve members independently rate the importance of the competencies. The importance of selected competencies and the perceptions regarding when various ones should be developed (pre-service or in-service) were compared for two groups of postsecondary teachers in production and agribusiness.

Both groups felt they had average or above average competencies in instruction-planning, instruction-execution, guidance and counseling, and professional role and development.

Lindahl (1977) examined the employment qualifications of postsecondary instructors of agriculture in Iowa area schools. He found that over fifty percent had a B.S. degree. About one-fourth of his group had an M.S. degree and one-fourth had less than a B.S. degree. Their average age was forty years. Two-thirds of the instructors came to their teaching position directly from industry. They averaged nine years of industry experience and two and a half years of teaching experience.

Description of Students in Postsecondary Agriculture Programs

For several years a continuing study in Ohio (Agricultural Technician Education in Ohio) analyzed factors regarding students in the state's agricultural technician programs and the effectiveness of each program. The studies were conducted by Iverson and Bender (1971);

Cummins and Bender (1972); and Erpelding, Cummins, and Bender (1974). These studies consistently revealed that students in agricultural technician programs were about nineteen years old; twenty-nine percent were from farms; about fifty percent lived within fifty miles of home; and about thirty-five percent commuted to school. Some typical conclusions of the studies included: (1) the number of students served will continue to grow, (2) agricultural technology programs, especially non-farming ones, will appeal to increasing numbers of students from urban and rural non-farm homes, (3) the major reason technical agriculture students continued education beyond high school was to earn more money, (4) no one group or person was a major influence in causing students to select a particular program, and (5) technical agriculture students generally performed in C+ and B+ range.

Status of Postsecondary Agriculture Programs

Erpelding reported that there were 1,334 postsecondary agriculture programs in 1975 and 1,640 in 1977. By 1977 enrollment was reported as 92,656 with 1,903 full-time faculty employed. There were 1,171 part-time faculty in 1976 and 1,585 in 1977. About 450 institutions offered postsecondary education in agriculture at less than baccalaureate level.

Postsecondary Student Organizations

At this time there are ongoing efforts to establish a national organization for agriculture students in two-year postsecondary institutions. Iverson (1971) prepared guidelines for such organizations. He sought to determine the current status of such organizations, identify the major constraints institutions have regarding such organizations, and offer guidelines for developing and operating such organizations.

Iverson learned that about seventy percent of the respondents to his questionnaire had agricultural student clubs; of these fifty-four percent were community or junior colleges, twenty-five percent were area vocational-technical centers, and the remainder were technical institutes or branches of four-year institutions. In comparing schools having agricultural student clubs with those which did not, he found several factors of significance. Student age, previous membership in 4-H or FFA, residence (farm), gender, departmental name, enrollment, faculty members, and the presence of an institutional

policy all had a positive relationship to the presence of student clubs associated with agricultural programs.

Eighty percent of the local institutions had only one agricultural student organization. Initial development of the groups was at the local level. Fifty-four percent were social or recreational organizations, twenty-eight percent were like technical societies, and about a fourth were similar to service clubs.

Summary

The research dealing with postsecondary education has provided a fairly good base of information on professional competencies needed by agricultural instructors. Several studies have examined the competency needs area and provided useful information.

There also is information dealing with the kinds of programs offered throughout the country. Likewise, there are general descriptions available of the type of agriculture teachers who are in the postsecondary institutions. Some information on student follow up is available. A set of guidelines is available for the development of postsecondary student organizations.

CAREER EDUCATION IN AGRICULTURE

There was very little work reported in this area in the early and mid-seventies. One investigation looked at factors affecting occupational choices, one examined a facet of vocational maturity, one assessed career guidance programs, and one studied the effect of a teaching unit on vocational maturity.

It should be pointed out that as a part of the curriculum development work at The Ohio State University (Householder, et al. 1976), curriculum guides were developed and tested for the entire continuum of career education. Those studies were reported in the section of this publication dealing with curriculum.

Bloss (1972) sought a relationship between enrollment in agricultural education courses and vocational maturity among secondary school students. He administered Crites' Attitude Scale of the Vocational Development Inventory and a questionnaire to two samples of high

school students. There were three groups included in the sample: students enrolled in vocational agriculture courses, students enrolled in other vocational courses, and students not enrolled in vocational courses.

Bloss found that the vocational maturity scores of the vocational agriculture students were significantly lower than the scores of the other vocational students, which were in turn lower than the scores of the non-vocational students. He revealed that females had significantly higher vocational maturity scores than males and that students with higher grade-point averages had higher vocational maturity scores. Another interesting finding was that vocational maturity scores were not related to the amount of time that students had been enrolled in vocational agriculture.

Byler (1972) attempted to determine if there were differences in certain aspects of vocational development among three groups of high school vocational agriculture students: (1) vocational agriculture students who planned to enter on-farm agricultural occupations, (2) vocational agriculture students who planned to enter off-farm agricultural occupations, and (3) vocational agriculture students who planned to enter non-agricultural occupations.

His population was a random sample from all junior and senior students enrolled in secondary agricultural programs in Illinois.

Byler found that 22.7 percent planned to enter on-farm occupations, 19.7 percent planned to enter off-farm agricultural occupations, and 57.6 percent planned to enter non-agricultural occupations. Students who planned to enter off-farm agricultural occupations received significantly higher vocational maturity scores and level of occupational aspiration scores than either of the other two groups.

Hanchey (1969) examined the educational and occupational aspirations and expectations of high school students. He used information from 1,054 high school students in grades nine through twelve in selected schools. He found that the education of the students' mothers and fathers was about equal. The fathers exerted more influence on occupational choices while mothers were more influential on the students' educational decisions. About fifty-three percent of the males and forty-two percent of the females said they aspired to be professional workers, but twenty-seven percent and twenty-six percent, respectively, actually expected to achieve this level. His findings showed that mothers were more influential on vocational choices. The primary reasons why students said they chose the occu-

pation were interest in the work, working conditions, wages, and contributions to society. The subjects considered most influential in students' vocational choices were English, health and physical education, mathematics, science, and civics.

Webb and Herring (1973) determined that career guidance needs of public school students in Texas were not being met. Specific deficiencies noted were: lack of interest and aptitude testing by counselors, lack of occupational information, too little work on techniques for making job applications, and a scarcity of information regarding postsecondary programs.

Brown (1974) examined the effect of being taught a career orientation unit in Applied Biological and Agricultural Occupations on vocational maturity. He used eighty ninth-grade classes in three groups: a career orientation group, a first-year agriculture group, and a control group.

He found a significant difference among the three groups in agricultural occupations knowledge, with ninth graders scoring higher than eighth graders. He also found that ninth grade career orientation classes and first-year agriculture classes scored significantly higher on agricultural occupations knowledge than eighth graders. First-year agriculture students and the control group scored significantly higher on Crites' Career Maturity Inventory Attitude Scale than did career orientation students. There were also differences in pre-test scores for those tests concerning knowledge of agricultural occupations and vocational maturity, when analyzed by location of residence, level of farm experience and gender.

CONCLUSIONS AND RECOMMENDATIONS

After reviewing the research in agricultural education completed since 1969, several conclusions and recommendations are apparent. The agricultural education research community has added substantially to the knowledge base in several areas.

The profession has an abundance of task analysis information for curriculum decision making. There are lists of tasks available for a multitude of agricultural occupations in all specialty areas. Similarly, there are nationally prepared curriculum guides available

for all specialty areas. However, little attempt has been made to evaluate task lists using actual field observations or to determine if workers who were taught the tasks perform satisfactorily in their occupations. The same is true for evaluations of proposed curriculum guides. The field testing of the nationally developed curriculum guides (The Ohio State University project) is essentially the only serious effort to evaluate such materials in terms of the performance of high school students studying under the direction of such materials.

There appears to be sufficient work completed in the area of identifying the professional competencies needed by vocational agriculture teachers. The profession could benefit, nevertheless, from coordinated inquiry into which competencies improve student learning.

There is substantial documentation of the shortage of vocational agriculture teachers and the research on why teachers leave the profession. There has been far too little change introduced as a result of all of the currently available findings. The shortage has in no way abated. To date there is no evidence of a recruitment program successful enough to attract the attention of the profession. The work by Craig shows that an ample supply of teachers of vocational agriculture are prepared annually. However, little is known as to why so many choose not to enter teaching. The fact that the national placement rate is about sixty percent generates continuing rhetoric in leadership circles, but has had little impact on solving this persistent difficulty.

Other than research previously mentioned, little has been added to the profession's cumulative knowledge. Most investigations continue to be conducted by graduate students. Quite often the reports of graduate research are better prepared, more thorough, and "cleaner" than those prepared by professors. Thus far, the high hopes for increased faculty or other full-time research have been unfulfilled. Faculty advisors do not share the vision of agricultural educators who are directing studies in specific areas, over a period of time, using graduate students.

Thus, agricultural education continues to lack the kind of programmatic research necessary for in-depth understandings essential to an emerging discipline. The various institutions of higher education continue to seek the soft dollars of those who determine what shall be investigated. Perhaps the profession needs to reflect again on the comments made by Dr. Krebs at the 1976 Central Region Research Conference in Agricultural Education. He offered some characteristics of agriculture

education research as compared to research in other disciplines and as seen by non-agricultural educators. Krebs stated that:

- There is a tendency toward fragmented one-shot studies.
- Agricultural education research is dominated by surveys.
- Studies lack depth.
- Results are reported and applied before fully supported by research.
- Funding is the basic orientation for planning.
- Research program development is non-existent.
- Research is not fully focused on agricultural education.
- Confusion exists between research and development.
- Agricultural education research is limited in applicability to other geographical areas in agriculture education and to other fields.
- Findings are not applied: (Research Conference Proceedings, Central Region, August 3-5, 1976, pp. 4-5.)

Another concern which became evident to the writer was that too often we ask ourselves if we are doing things correctly; too often we ask the subject being studied to judge his or her ability and report it to us; too often we use superficial measuring and too seldom do we perform a detailed and definitive post mortem. It appears that research skills have continued to improve. The basic methodologies used are far more rigorous, appropriate and sound today than one or two decades earlier.

While all of these are good signals, they should be accompanied by some extremely serious concerns. Ground continues to be lost in the area of conceptual framework. Problems selected for study are often overly simplistic or handled in over-simplified ways. Too many miniscule problems are being investigated. On the other hand, there have been too many attempts to demonstrate earth shaking changes in highly complex areas in short periods of time (one week of instruction) or with narrow programs (using a ten-page reference or viewing thirteen slides). In essence, it is being argued that the design and mechanics "are all there" but are being applied without an accompanying level of clear thinking.

Warmbrod treated this issue masterfully in a paper entitled "Quality Research in Agricultural Education" delivered at the 1977 Central Region Conference in Agricultural Education. He stated, "The first and probably most important indicator of quality is the nature of the problem being investigated." Warmbrod quoted from H. M. Hamlin and reminded us that "Research without important ideas is busy work."

Warmbrod continued, "...the problems we research (should) be sensible as well as significant....My point is that we are not dealing with these important and complicated phenomena in a sensible manner unless our research demonstrates that we know and understand a great deal about these psychological attributes, including how these characteristics are acquired and altered....Research in agricultural education will not be labeled as high quality if it is evident that the researcher is naive about the major ideas and concepts that are the substance of and the theoretical constructs basic to the research." (pp. 16-17) Our research also shows that we often are more interested in chasing the latest fad than staying with the basic tenets of agricultural education and ferreting out new and better answers needed in the practice of our basic beliefs.

One of the frustrating experiences in preparing this review was the large number of areas of investigation where there were only isolated studies, few of which built new knowledge. Much of the information located applied to only one state. A hopeful sign is that perhaps the McClay (1977) project will offer the profession insight as to how there can be more coordinated investigations with broad applicability.

Another observation is that not nearly enough research findings reach practice. The accumulation of knowledge should be in evidence in the books of a profession. Agricultural education has very few books to serve as depositories of research. In addition, very little research has been conducted regarding administration and supervision.

We surely must conduct more research in the areas of teaching the disadvantaged and in career education. Likewise, the profession desparately needs defensible information regarding personnel needs in the agricultural industry. We can ill afford to make crucial program decisions without valid information on future personnel needs.

In closing, the status of research in agriculture education is not what it ought to be. The gap between what is and what should be must be closed in the immediate future if we are to continue to progress, to live up to our potential, and--most importantly--to serve our clients, the students.

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